

2.3 MARKET PROFILE OF MHC TECHNOLOGIES

The market for MHC chemicals is characterized as being very competitive with slim profit margins, similar to the PWB manufacturing industry (Nargi-Toth, 1997). The industry trade association, the Institute for Interconnecting and Packaging Electronic Circuits (IPC), has a Technology Market Research Council (TMRC) that tracks market, management and technology trends for the electronic interconnection industry. The TMRC publishes annually information on the total value of chemicals used in producing PWBs and the total value of chemicals used in specific applications, such as plating, solder mask, etching, and imaging. Information on plating chemicals is further broken down to include additive/full build copper, electroless copper, electrolytic, etch back/desmar, and oxide process chemicals. Table 2.3 presents TMRC chemical market data for 1985, 1990, and 1995, including the total value of PWB chemicals and the value of electroless copper chemicals. TMRC does not list market values for the alternative MHC chemical products separately.

Table 2.3 Market Value of PWB and Electroless Copper Chemicals^a

	1985	1990	1995
Total Value of Chemicals Used to Produce PWBs	\$336 million	\$495 million	\$580 million
Value of Chemicals Used in Electroless Copper Process (excluding basic chemicals)	\$48 million	\$60 million	\$52 million
Percent of Total Chemicals Market Held by Electroless Copper Chemicals	14 %	12 %	9 %

^a Source: IPC Assembly Market Research Council Meeting and IPC Technology Market Research Council Meeting materials provided by Christopher Rhodes/IPC.

For the three years shown in Table 2.3, the market value of PWB chemicals increased between 1985 and 1995, but the market value of electroless copper chemicals peaked in 1990 prior to a decline in 1995. Part of the decline may be due to the increased use of the MHC alternatives in this decade.

Until the latter half of the 1980s, all PWB shops were using an electroless copper process to perform the MHC function (EPA, 1995). Circuit Center in Dayton, Ohio was one of the first U.S. PWB facilities to use an MHC alternative for full-scale production. Circuit Center began beta testing a carbon technology in the mid-to-late 1980s, went to full scale use of the technology in 1989, and has since implemented a graphite technology (Kerr, 1997). By 1995, one supplier estimates 80 percent of shops were using electroless copper, with the rest using mainly carbon, graphite, or tin-palladium (Nargi-Toth, 1997). Another supplier estimates the current market value of the MHC alternatives at about \$7 to \$8 million, with carbon and graphite technologies accounting for about \$5 to \$5.5 million of that market (Carano, 1997). Currently, the first full-scale conductive polymer line in the U.S. is being installed by H-R Industries in Richardson, Texas.

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